

Torrential rains test Corps Big Island flood control projects

Story by Alexander Kufel

As rains on the Big Island of Hawaii in early November built up to record-breaking levels and concern mounted as stream banks overflowed and bridges washed out from the unprecedented torrent, a number of Honolulu Engineer District (HED) employees also watched with bated breath. Their concern was with the performance of several flood control projects that the District designed and built—Alenaio Stream, Wailoa Stream and Paauau Stream. It was a great relief to everyone that the three projects successfully carried at least as much water as the 100-year-flood levels for which they were designed. Civil engineer technician Dan Meyers, EC-T, found that out upon boarding a plane and going to Hilo as soon as he could to do a preliminary “post-event” assessment.

“I had walked our flood control projects many times on our regular O&M (Operations and Maintenance) inspection rounds and I wanted to see how certain sections performed under the pressure of 37 inches of rainfall within a very short period,” said Meyers. O & M inspections are conducted regularly by HED in conjunction with the State of Hawaii. “Early reports said that there was a lot of devastation along certain stream paths so I also wanted to start the ball rolling toward releasing emergency funds if it was warranted,” he said.



The Alenaio Flood Control Project is functioning near capacity carrying a torrent from 37 inches of rain in two days. —Photo by Dan Meyers.

Joel Hendrix, EMD chief, agreed. “We believe the flooding peaked about 2 a.m. Dan was on the phone very early in the morning seeking authorization to do an assessment. Our immediate concern was for the welfare of the residents of the hardest hit areas,” he said. “Dan was able to confirm early that there was no loss of life and that although there was some property damage to homes

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Laughter: *You don't stop laughing because you grow old; you grow old because you stop laughing.*
—Michael Pritchard, motivational speaker

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age to homes in areas other than our projects, major tragedy was averted."

Meyers also confirmed that while the three projects performed

as designed and protected surrounding homes and property, they did experience some damage to themselves. Hydraulic engineer Jim Pennaz, chief of Civil Works Technical Branch and the designer of the Alenaio Flood Control Project, said that all three

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projects were designed to carry the water that would develop in a "100-year-flood-level event" and that each performed very well considering that this particular event exceeded that. By way of explanation, Pennaz said that a 100-year level translates to a one percent chance per year that water flow in a specific area will exceed established levels.

Preliminary estimates by the Corps based on high-water marks in the project site areas and other data indicated that the Alenaio Flood Control Project (FCP), which cost nearly \$16 million when it was completed in 1998, prevented losses estimated at more than \$14 million, and nearly paid for itself during this recent event. The quantity and force of the water was such, however, that Alenaio FCP did not emerge completely unscathed. It sustained erosion damage at various sites along the stream bank throughout the project. Water overtopped the project at one location, but the overflow was contained by an adjacent channel and rapidly returned to the project. Rehabilitation costs for this project will be 100 percent federally funded and are estimated at \$368,000.

Ten floods struck downtown Hilo from 1920 through 1994 when the decision was made to go ahead with the Alenaio FCP. This was the first real test of the project since 15 inches of rain fell on Hilo during a two day period in August 1994 just before construction started.

According to similar preliminary estimates, the Wailoa Stream FCP prevented damages of nearly \$1.5 million, although a 150-foot stretch of levee was overtopped

when the natural stream path changed at the upstream end of the project. Some 300 feet of rip-rap and 200 feet of concrete also washed away and will be replaced. Rocks and debris that ended up on the nearby UH-Hilo baseball field are being disposed of by the State of Hawaii. Costs for rehabilitation of this project are 100 percent federally funded and are estimated at \$1.6 million.

The Paauau Stream FCP near Pahala prevented estimated losses that could have exceeded \$1.5 million, although it too sustained damage to a number of locations along the channel. Costs for rehabilitation of the Paauau Stream FCP are 100 percent federally funded and are estimated at \$1.1 million.

Hydraulic engineer Nani Bennett, EC-T, said that in addition to these sites, the flood control project at Waiakea Stream, which was built by the County of Hawaii in 1985, is eligible for public funds to repair damages it received estimated at about \$1.12 million. A total of 1,700 linear feet of natural side slope was scoured, as were portions of the channel bottom. Under Public Law 84-99, 80 percent of the estimated amount will be federally funded. A condition of eligibility for those monies under the public law is regular maintenance and a joint Corps of Engineers/State of Hawaii O & M inspection every other year.

Repairs to all four projects are estimated at \$4.19 million. HED project manager David Kern, PP-C, said that reports have just been finalized. Rehabilitation plans and specifications will be initiated in January 2001 with awards for construction expected around March. The goal is to complete repairs prior to the start of the next flood season which usually begins around the end of October.

Conclusive figures for Hawaii island-wide damages are not yet available.



Alenaio Stream outlet showing water level as it exits the flood control project.

—Photo by Dan Meyers.